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Development of Study Materials Based on Adobe Flash CS6 for Grade-X Students at MA Madani Pao-Pao[*]

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ABSTRACT

The research was a kind of Research and Development, aiming to develop valid, practical, and effective Explorative Mathlets learning media. The Alessi and Trolip development model was used as in usually employed in technology-based development. This model consists of three stages: first, the planning stage which includes development in achieving the goals and directions of the project development; secondly, the designing stage which includes the creation of initial content and the arrangement of the project direction, and; thirdly, the development stage which includes the creation or implementation of the design stage, alpha testing by media experts and material experts, revisions, beta tests, and ends in field trials. The subjects of this research trial were students of grade X of MA Madani Pao-Pao

Keywords: *explorative mathlets, Trigonometry, Adobe Flash Cs6*

INTRODUCTION

Education functions to guide, teach, or train both within schools and outside to prepare people to face the future (Jannah, 2015). Activities that become routines where educators explain the material and students receive material (Fadila at all, 2019) . The primary objective of education is to help people face various challenges. For this reason, education must be maximized properly so that the results are in line with shared expectations (Yoga at all, 2015). Activities that become routines where educators explain the material and students receive material.

The recent rapid growth of technology calls for a change in the system of teaching and learning delivery (Wekke & Hamid, 2013). Indonesian people need innovations in their learning processes, to create a world of education adaptive to changing times. Learning basically is an effort to direct students into the learning process, letting them obtain learning objectives in accordance with what is expected. Learning is the process of communication between students, teachers, and teaching materials (Miaz at all, 2018).

The basic problems experienced in

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the scope of education have challenged the observers (Kicthenham at all, 2011), especially those who are engaged in mathematics, science, and technology. In this case, the authors would focus on research on the problem of the lack of use of exploratory learning materials, especially those based on technology in the learning process (Koswara & Rosita, 2017). Such a lack was found to result in non-optimal learning outcomes, especially in mathematics subjects that require a strong understanding of concepts and an interesting and not boring learning process.

Mathematics is a subject that has the least number of enthusiasts compared to other subjects because of its difficulty, making people do not like it. One of its materials difficult for most students to master is trigonometry (Putra & Ruly, 2016), which is taught at the high school and college level. Generally, these materials are taught after students complete the prerequisite materials, namely the Pythagorean materials. The presence of teachers becomes the key of better classroom management so that teachers need to convey material with appropriate methods (Wekke at all, 2017). The student should develop the knowledge in their mind. The teacher facilitates this process by utilizing teaching methods that make the information truly meaningful and relevant to the student (Yusuf & Wekke, 2015) Students often do not understand that these concepts are an important part of mathematics. They have difficulty in learning mathematics, especially those related to concepts, definitions, theorems, and proofs, so that they experience boredom in learning mathematics.

Learning media is one of the important components of learning (Pardemin at all, 2018) resources that can determine the success of students in their learning processes. Learning media is used as an intermediary tool for lesson information or as a tool for teachers to deliver lesson material. One type of learning media that can be used is interactive multimedia. (Ampera, 2017). Technological developments make it easier to build and access learning media. Some kinds of software are available to create learning media and make them more interesting and can be easily produced. Multimedia has successfully used in learning at various levels of education and has brought various benefits, especially in Indonesia to make children's learning process more smoothly (Riswandi at all, 2022).

Our government has done many efforts in improving the quality of mathematics education. The last effort is the implementation of The Curriculum 2013 (Sukariasih at all, 2019). One effort that can be done to improve the quality of mathematics learning is to integrate mathlets (mathematical applets) in mathematics learning. Mathlets in this study mean computer programs that are not too large (so it is not too complex) whose function is as media where students can explore the mathematical concepts being studied. Applets are generally created using Java. However, now they can also be created using Excel, Maple, Geonext, Geogebra, Geometer Sketchpad, Adobe Flash, CAR, and others.

Mathlets allow mathematical concepts to be presented not in finished form, but as a phenomenon where students are first directed to explore before they finally arrive at an abstract formula, which is basically just the final summary of the whole process and concept being studied. Mathlets are easily designed to be multi-representative by presenting a mathematical concept at once in algebraic, numeric, and graphic forms. In this way, the mathematical concepts learned will become richer in representation, more intuitive, more clearly interrelated, more meaningful, and more in line with curriculum expectations.

Based on observations at MA Madani Pao-Pao of Gowa Regency by conducting interviews with one of the mathematics teachers in Grade X, Mrs. Namira, it was found that students still often experienced boredom during the learning process because no learning media were used. In addition, many students' learning outcomes were less than optimal, especially in trigonometry subjects, as shown by the results of daily tests. Based on the description above, the authors were interested in performing a study under the title Development of Explorative Mathlets for Trigonometry Study Materials Based on Adobe Flash CS6 for Grade-X Students at MA Madani Pao-Pao.

METHOD

This research was conducted at the MA Madani Pao-Pao, Gowa Regency, using the Research and Development (R&D) method. This method is useful for making particular products and evaluating their effectiveness (Sugiyono, 2013).

This study used the Alessi and Trolip development model, which consists of 3 multimedia stages: planning, designing, and development stages. The research design in this trial was a one-shot case study design, which is a process that is used once to collect data.

The trial subjects of this Explorative Mathlets product development process for trigonometry were 3 students of Grade X at MA Madani Pao-Pao on Jalan Bontotangan, Paccinongan, Somba Opu District, Gowa Regency, Sulawesi Selatan.

DISCUSSION

Design Procedure

The development of Explorative Mathlets learning product has been carried out using the Alessi and Trolip development model which consists of 3 stages, namely the planning stage, the design stage, and the development stage. The planning stage is the stage of identifying problems in learning mathematics, followed by identifying needs. First, the study of the materials found that the students found difficulty in understanding trigonometry. This is due to their lack of references or reflections on the material they are studying; they learned only based on mathematics textbooks. In addition, trigonometry materials are very suitable for use in exploratory mathematics learning materials, which allow the students to see what they are learning in real terms.

After looking for information about making learning materials and applications that can be easily obtained and operated and in accordance with the materials, the Adobe Flash CS6 application that can be used to run products that have been developed is not only able to run on a laptop or computer but also through mobile phone using the Webgenie SW Player application was made.

After that, the materials used in the development of these learning materials are a laptop with the adobe flash CS6 application, a mathematics textbook for class X MIA Senior High School (SMA) 2013 curriculum, and a math syllabus for Grade X MIA SMA.

The designing stage was made to determine the layout loaded. It aimed to make it easier to implement.

Utilization Procedure

Figure 1. Intro Display

This intro display is the start page, which displays a welcome greeting and a moving image. After a few moments, the users will be invited to enter the application.

Figure 2. Main Menu

After the intro display, the main page will appear. This page consists of a volume navigation

button that functions to mute and activate the sound, an exit button (located beside the volume button) which functions to exit the main page, and several menu options, namely: About Mathlet, KD and Indicators, Materials, Videos, and profiles. The following is a description of the five menus.

Figure 3. About Mathlet

If the user clicks the "About Mathlet" button, a display as shown by the image above appears. This menu contains descriptions of the navigation buttons starting from "enter the main menu" to "exit the program."

Figure 4. Basic competencies and Indicators

If the user selects the Basic Competence and Indicators menu, then she/he will get a display like the one in the picture above which contains basic competencies and indicators for trigonometry teaching materials. When the user clicks on the image on the indicator, the screen will show a new display showing the indicators.

Figure 5. Materials

If the user selects the material menu, the screen will display as shown above, which contains navigation buttons of definition, identity, sine rule, addition, and sample questions. Clicking on the definition button allows the screen to display materials about the definitions of trigonometry; the identity button will show the identities of trigonometry, while; the sine rule button will show materials about the sine and cosine rules.
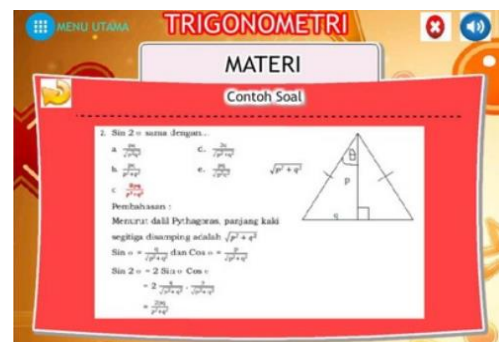
Figure 6. Example Question

After understanding the various materials provided, the user then moves on to questions that are useful for training the user's abilities, especially in trigonometry materials.

What distinguishes each page is only the content of the customized display on the mathlets learning product. The finished products are saved in .fla format so that they can still be edited if there are errors. If they are ready to use, then they are exported to .swf and .exe formats.

CONCLUSION

Based on the description above, it can be concluded that this research consisted of three stages, namely the planning stage, including development in achieving the goals and directions of project development; the second stage, namely the designing stage, which includes the creation of the initial content and the arrangement of the

project direction, and; the third stage, namely the development stage, which includes the creation or implementation of the designing stage, alpha tests by media experts and material experts, revisions, beta tests, and ends in field trials.

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